



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,107	12/09/2005	Igor Lubomirsky	LUBOMIRSKY=1	2902
1444	7590	05/13/2010	EXAMINER	
BROWDY AND NEIMARK, P.L.L.C.			NGUYEN, KHANH TUAN	
624 NINTH STREET, NW			ART UNIT	PAPER NUMBER
SUITE 300			1796	
WASHINGTON, DC 20001-5303			MAIL DATE	DELIVERY MODE
			05/13/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/560,107	<b>Applicant(s)</b> LUBOMIRSKY, IGOR
	<b>Examiner</b> KHANH T. NGUYEN	<b>Art Unit</b> 1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 May 2010.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20,24-35 and 38-41 is/are pending in the application.

4a) Of the above claim(s) 2,3 and 38-40 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1,4-20,24-35 and 41 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/06)  
 Paper No(s)/Mail Date none

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date: \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the **Finality** of that action is withdrawn.
2. The amendment filed on 05/04/2010 is entered and acknowledged by the Examiner. Claims 1, 4-20, 24-35 and 41 are currently pending in the instant application. Claims 2, 3 and 38-40 have been withdrawn from further consideration. Claims 21-23, 36 and 37 have been cancelled.
3. The amendment to the Specification filed on 05/04/2010 is entered and acknowledged by the Examiner.
4. The objections of claims 36 and 37 have been rendered moot in view of the above amendment.
5. The rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. 4,067,056 (Taylor) is withdrawn in view of applicant's remarks.
6. The rejection of claims 1, 4-20, 24-37 and 41 under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. 2003/0033700 A1 (Takeuchi) in view of either U.S. Pat. 5,483,842 (Foreman) or US Pat. 6,048,622 (Hagood) is withdrawn in view of applicant's remarks.

***Information Disclosure Statement***

7. No additional information disclosure statement (IDS) filed.

***Claim Rejections - 35 USC § 102/103***

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**Claims 1, 5-20, 24-30 and 41 are rejected under 35**

**U.S.C. 102(b) as anticipated by or, in the alternative, under 35  
U.S.C. 103(a) as obvious over U.S. Pat. 4,342,648 (hereinafter  
refer to as MacKenzie).**

With respect to claims 1, 5-20, 24 and 41, MacKenzie discloses a method for forming amorphous ferroelectric material (See Title). The amorphous ferroelectric material including LiNbO<sub>3</sub>, Pb(Zr,Ti)O<sub>3</sub>, (Pb,La)(Zr,Ti)O<sub>3</sub>, Pb(Zr<sub>x</sub>T<sub>(1-x)</sub>)O<sub>3</sub> wherein x = 0 to 1, and BaTiO<sub>3</sub> (Col. 3, lines 10-25; Col. 7, lines 2-3; Col. 8, lines 30-40). The amorphous ferroelectric material of MacKenzie, e.g. amorphous BaTiO<sub>3</sub> and (Pb,La)(Zr,Ti)O<sub>3</sub>, is structurally same as the claimed oxide compound of formula (A<sub>x</sub>B<sub>1-x</sub>)<sub>y</sub>O<sub>n</sub> and (A<sub>x</sub>B<sub>1-x</sub>)(C<sub>y</sub>D<sub>1-y</sub>)O<sub>n</sub>, respectively, as recited in **claims 5-14, 17, 19 and 20**. The amorphous ferroelectric material of MacKenzie is a non-crystalline ionic solid as recited in **claim 41** (Col. 8, lines 35-36). The amorphous ferroelectric material of MacKenzie is a quasi-amorphous compound as described by the

Art Unit: 1796

applicant (See Page 5 of the Specification). MacKenzie further discloses the amorphous ferroelectric material having pyroelectric coefficient as recited in claims 15, 16 and 18 (See Fig. 2; Col. 8, lines 24-26).

The limitations of "said pyroelectric compound being a product of application of a mechanical strain to a substantially amorphous compound" and "said mechanical strain being controlled so as to prevent crystallization of said compound" are product-by-process limitations and are not limited to the manipulations of the recited steps, only the structure limited by the steps. Therefore, the patentability of the product does not depend on its method of production and the claimed steps were not given patentable weight. Nonetheless, MacKenzie discloses the amorphous ferroelectric material subjected to mechanical strain such as poling and electric field (Col. 8, lines 21-26; Col. 11, lines 59-63) which provide a quasi-amorphous compound with pyroelectricity as described by the applicant (See Page 4 lines 19-23 and Page 8 lines 24-25 of the Specification). Thus, one skilled on the art would have had a reasonable expectation that the amorphous ferroelectric material of MacKenzie would have a quasi-amorphous morphology and piezoelectric properties as recited in **claims 1 and 24.**

The reference specifically or inherently meets each of the claimed limitations. The reference is anticipatory.

Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct, not the examiner to show the same process of making, see *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Regarding **claim 25-27 and 29-30**, MacKenzie discloses the material can be deposited on a silicon surface and is useful in a broad variety of electronic opto-electronic and optical devices (Col. 11, lines 24-41).

Regarding **claim 28**, MacKenzie discloses the material having a coating thickness of 1600 angstroms, i.e. equivalence to 0.16 microns, as required by the instant claim (Col. 10, lines 55-67).

9. **Claims 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. 4,342,648 (hereinafter refer to as MacKenzie) .**

Mori is relied upon as set forth above. With respect to instant claims, MacKenzie discloses an amorphous ferroelectric

Art Unit: 1796

material that is useful in a broad variety of electronic opto-electronic and optical devices (Col. 11, lines 24-41), but failed to expressly suggest using the amorphous ferroelectric material in specific devices as claimed.

However, it would have been obvious to a skilled artisan to use the amorphous ferroelectric material of MacKenzie in the claimed devices since devices containing oxide compounds such as BaTiO<sub>3</sub>, as claimed, are known in the art at the time the invention. Thus, it is a *prima facie* obvious to use a known material in the devices as claimed.

Thus, it would have been obvious for a skilled artisan use the amorphous ferroelectric material of MacKenzie in a device as claimed and the result would have been predictable.

In view of the foregoing, the above claims have failed to patentably distinguish over the applied art. The applicant is invited to contact the examiner for an interview.

***State of the Art***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**US Pat. 4,500,397** discloses a method for preparation of a pyroelectric material (See Title) that is useful as IR sensors

Art Unit: 1796

(Col. 1, line 35) comprising of a step of treating a pyroelectric particle including LiTiO<sub>3</sub>, LiNbO<sub>3</sub>, BaTiO<sub>3</sub> or PZT with a temperature gradient and an electrical field to orient the pyroelectric axes of the particles in the same direction and polarity to form a layer of polarized pyroelectric crystal particles that is difficult or impossible to switch direction or sense of spontaneous polarization (Col. 2, lines 15-35).

**US Pat. 5,504,330** discloses a device such as miniature mechanical devices, sensors and standing acoustic wave devices (Col. 7, lines 24-26) containing a ferroelectric or pyroelectric layer having a ABO<sub>3</sub> composition (Abstract).

Applicant is invited to contact the undersigned examiner in order to discuss possible ways of overcoming the above rejections.

***Response to Arguments***

11. Applicant's arguments with respect to the claims above have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHANH T.

Art Unit: 1796

NGUYEN whose telephone number is (571)272-8082. The examiner can normally be reached on Monday-Thursday 7:00-6:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Kopec/  
Primary Examiner, Art Unit  
1796

/K. T. N./  
Khanh T. Nguyen, Art Unit 1796  
May 10, 2010